

DATURA SP.: WEED, ORNAMENTAL, DRUG,  
POISON; WITH A BIZARRE MEDICAL HISTORY

C. R. Artaud and K. R. Langdon

The genus Datura in the family Solanaceae is distributed throughout warm-temperate and tropical regions of the world and contains over a dozen to possibly 25 species with numerous common names. Datura, Angel's trumpet, Jamestown weed, Jimson weed, thorn-apple, and apple of Peru are the most generally used names in the United States. Several species are found native and naturalized in the United States, and several others are occasionally cultivated for their conspicuous flowers and fragrances.

The most common species in Florida are D. stramonium L. (fig. 1), D. metel L., D. meteloides Dunal, D. candida (Pers.) Pasquale, D. arborea L., and D. suaveolens Humb. & Bonpl. In addition to plants under cultivation, it is common to find them in waste areas, barnyards, heavily used pastures, and roadsides. There are numerous instances of livestock being poisoned from eating datura when other forage was scarce.

The technical description of the genus Datura is given by Gentry and Standley (1974) as follows:

Herbs, shrubs, or small trees, glabrous or pubescent; leaves alternate, entire to sinuate, or shallowly lobed, membranaceous, petiolate; inflorescences consisting of a solitary flower, the flowers pedicellate and in the forks of the branching stem, small or very large and showy, erect or pendulous; calyx long tubular, 5-lobed or spathe-like and cleft down one side, sometimes circumscissile near the base and leaving a persistent flaring collar under the fruit; corolla funnelform or narrow funnelform, white, yellow, pink, or red, the limb 5-lobed or 10-toothed, the lobes acuminate to long caudate, plicate in bud, the tube long and slender; stamens 5, inserted near the middle of the corolla tube, included or slightly exserted; filaments slender, pubescent or glabrous below; anthers linear, free or rarely coherent, longitudinally dehiscent; ovary bilocular (sometimes falsely tetralocular), the ovules numerous; style filiform, included; stigma bilobed; fruit a capsule, 4-valvate or breaking open irregularly, armed with spines or unarmed; seeds numerous, laterally compressed or angulate; embryo curved.

Datura has had a long and interesting history in countless civilizations around the world. Early Sanskrit writings mention datura. Virgil and Shakespeare wrote of its properties. Numerous accounts are recorded of its widespread distribution as well as its multiple uses. Found throughout Asia, Africa, America, and Australia, datura has been used, abused, and misused for everything from headaches to hemorrhoids. Scientific and historical accounts reveal its usage as a mind-altering decoction in primitive puberty rituals, a pesticide, a green dye, an aphrodisiac, a relief for asthma sufferers, a local anesthetic, a dandruff cure, and many others. Some of the more dramatic accounts include its use by prostitutes to stupefy their clients, making them more vulnerable to robbery. Datura was also used by priests to make rain and to find gold. South American tribes fed datura extracts to young maidens to calm them before burying them alive.



Fig. 1. Datura stramonium (after West and Emmel, 1960)

Because of the high toxicity of the plant, it is not unusual to find historical accounts of its calculated use to poison victims. Women of the East Indies fed datura leaves to beetles then poisoned unfaithful lovers with the beetle excrement.

Accounts consistently warn of the toxicity of datura, all parts of the plant being toxic, with the seeds and young leaves the most toxic and the roots the least. Even pollen or honey made from nectar of datura flowers is toxic. Entire groups of people have been poisoned when datura seeds were accidentally ground with grain for bread or when beans were contaminated with datura seed. The genus contains alkaloids common to the nightshade family (Solanaceae). In fact, there are instances when datura has been mistaken for, and even used as a substitute for belladonna (*Atropa belladonna* L.), the primary source of atropine.

The chief alkaloids found in datura are atropine, hyoscyamine, hyoscyne (scopolamine), and meteloidine. It must be strongly stated that poisoning may occur from an overdose of any of the alkaloids found in datura. It is difficult to determine the amounts of material ingested in poisoning cases, but based on the toxicity of atropine, it is generally believed that as little as 4 grams of the leaf can be fatal to a child. This is particularly distressing because the large flowers and spiny seed capsules are very attractive to children.

Many variables in the toxicity of the alkaloids make it difficult to categorize the symptoms. Alkaloid concentration, method of ingestion, dosage, etc., influence the reaction. Symptoms may appear within minutes or not for several hours. Extreme thirst and dilatation of the pupils are usually the first symptoms. Even drinking large amounts of water does not satisfy the thirst. Vision is impaired, and hallucinations occur to the point that the victim begins grabbing at objects that are not present. A high temperature, flushed skin, and extremely rapid heartbeat are usually observed. The subject is delirious and may become violent. Severe cases lead to convulsions followed by coma and death. With less than fatal doses, symptoms subside in 12 to 48 hours. Impaired vision may persist up to 2 weeks. In some cases, recovery takes place after a period of lethargy where the subject may not even recall what has happened. An account from Jamestown in 1676 concerns a whole troop of soldiers who ate the leaves of datura in a salad. After eleven delirious days, the symptoms passed and not one of them could recall what had happened.

A few people have foolishly tried datura as a hallucinogenic drug, but this practice is extremely dangerous and may easily prove fatal.

Since datura is widely distributed in the United States people need to be aware of its toxic properties. If poisoning symptoms are noticed, immediate medical attention is needed. Vomiting should be induced if the case is recognized early. Datura poisoning is similar to that of atropine and is treated accordingly with morphine, physostigmine, caffeine, or similar medications.

### Selected References:

- Arnold, H. L. 1968. Poisonous plants of Hawaii. Charles E. Tuttle Co., Tokyo. 71 p.
- Brown, W. H. 1950. Useful plants of the Philippines. Acorn Press, Ballarat, Australia. Vol. 3, 507 p.
- Emboden, W. A., Jr. 1972. Narcotic plants. Macmillan, New York. 168 p.
- Gentry, J. L., Jr., and P. C. Standley. 1974. Flora of Guatemala. Fieldiana:Botany 24 (X, 1-2): 37-42.
- Kingsbury, J. M. 1964. Poisonous plants of the United States and Canada. Prentice-Hall, Englewood Cliffs, New Jersey. 626 p.
- Martinez, M. 1959. Plantas utiles de la flora mexicana. Ediciones Botas, Mexico, D. F. 621 p.
- Neal, Marie C. 1965. In gardens of Hawaii. Bishop Museum Press, Honolulu. 924 p.
- Schleiffer, Hedwig (compiler). 1973. Sacred narcotic plants of the new world Indians. Hafner, New York. 156 p.
- Standley, P. C. 1920-26. Trees and shrubs of Mexico. Contribution from the United States Herbarium, Vol. 23. Smithsonian Press, Washington, D. C. 1721 p.
- Watt, J. M., and Maria Gerdina Breyer-Brandwijk. 1962. The medicinal and poisonous plants of southern and eastern Africa. E. & S. Livingstone, London. 1457 p.
- West, E., and M. W. Emmel. 1960. Plants that poison farm animals. Univ. Fla. Agric. Exp. Sta. Bull. 510 A. 55 p.